DOCUMENT RESUME

ED 084 666		EA 005 645
AUTHOR	Tarapata, Peter	
TITLE	Planning for Change. Spaces for Career Preparation: Document 4.	
INSTITUTION	Michigan State Univ., East Lansing. Continuing Education Service.	
SPONS AGENCY	Michigan State Dept. of Education, Lansing. Vocational Education and Career Development Service.	
PUB DATE	73	
NOTE	13p.; A Michigan Career Education Facilities Project; Related documents are EA 005 644 and EA 005 646	
AVAILABLE FROM	Council of Educational Facility Planners, International, 29 West Woodruff Avenue, Columbus, OH 43210 ($3.50)	
EDRS PRICE	MF-$0.65 HC-$3.29	
DESCRIPTORS	*Building Plans; *Career Education; Educational Change; *Flexible Facilities; Guidelines; Modular Building Design; *Planning (Facilities); Space Classification; Space Dividers; *Space Utilization	

ABSTRACT

This document incorporates the findings of a project initiated to find solutions to the problems of planning, designing, constructing, and utilizing facilities to house career education on the part of educational administrators. Traditional solutions, continually increasing costs, and the need for greater emphasis on the learning environment provided the impetus for focusing attention on the options for local determination with minimum emphasis on regulating procedures. Project findings reveal that the design of new flexible facilities for career education requires space management--matching students' learning needs (curriculum) with the things of learning (space, tools, aids), placing them within a time frame (schedule), and doing this all within an allotted budget. Suggestions and building designs are offered for flexible facilities into which an almost infinite variety of settings can be placed that include delivery of the services necessary for facility operation without destroying the universal quality of the space. (Author/MLF)

SPACES FOR
CAREER PREPARATION

PLANNING FOR CHANGE

by Peter Tarapata

MICHIGAN CAREER EDUCATION FACILITIES PROJECT

Author **PETER TARAPATA, FAIA,** is a principal in the firm of Tarapata MacMahon Paulsen Corporation, Bloomfield Hills, Michigan. He holds a Master of Architecture in Architectural Design from the University of Michigan, and is also a graduate from the College of Civil Engineering, Michigan State University. In addition to being a Fellow in the American Institute of Architects, Mr. Tarapata is the recipient of many design and architectural merit awards.

Additional copies of this publication, or others in the series of documents on Sapces for Career Preparation, may be obtained from:

Council of Educational Facility Planners, Int'l.
29 West Woodruff Avenue
Columbus, Ohic 43210

$3.50

1973

ACKNOWLEDGMENTS

In January of 1972, The Continuing Education Service, Michigan State University, initiated a research project to become known as the Michigan Career Education Facilities Project. Funding for the Project was made available by the Vocational Education and Career Development Service, Department of Education, State of Michigan.

The relative newness of the Career Education Movement and the recognized need for planning, designing, constructing and utilizing facilities to house Career Education on the part of the educational administrators, facility planners and designers was evident. Traditional solutions, continually increasing costs and the need for greater emphasis on the learning environment prompted the State Educational Agency to give maximum attention to the options for local determination with minimum emphasis on regulating procedures. Hopefully, they will find this series of documents viable tools in their efforts.

The Committee on Architecture for Education, American Institute of Architects, reviewed the Project in its early stage and designated Les Tincknell of Wigen, Tincknell and Associates, Inc., Saginaw, Michigan, as its representative and liaison to the project.

C. Theodore Larson, Professor Emeritus, School of Architecture and Design, University of Michigan, was designated as an architect-educator advisor to the project.

A *first* step resulted in the designation of an Advisory Committee to assist in the development and evaluation of the project. Members included:

William Chase, Program Officer
U.S. Office of Education
National Center for
Educational Technology
Washington, D.C.

Richard Featherstone, Professor
Administration and Higher Education
College of Education
Michigan State University
East Lansing, Michigan

Dwayne Gardner, Executive Director
Council of Educational Facility
Planners, International
Columbus, Ohio

Ben Graves, Project Director
Educational Facilities Laboratories, Inc.
Chicago, Illinois

Milton Miller, Director
Educational Facilities Planning
Grand Rapids Board of Education
Grand Rapids, Michigan

Donald Leu, Dean
School of Education
San Jose State College
San Jose, California

The *second* step involved the appointment of an architectural-planning team whose primary responsibility was to study the recognized needs and propose options for solving local career

facility problems. The team included:

William E. Blurock
William Blurock and Partners
Corona Del Mar, California

C. William Brubaker
Perkins & Will Architects, Inc.
Chicago, Illinois

Stan Leggett
Stanton Leggett and Associates, Inc.
Chicago, Illinois

Linn Smith
Linn Smith, Demiene, Adams, Inc.
Birmingham, Michigan

Peter Tarapata
Tarapata-MacMahon-Paulsen Corporation
Bloomfield Hills, Michigan

The *third* and *final* step in the Project involved the final editing, publication and dissemination of the project findings. This is one of a series of five publications to be released to educators, planners and architects. The series include:

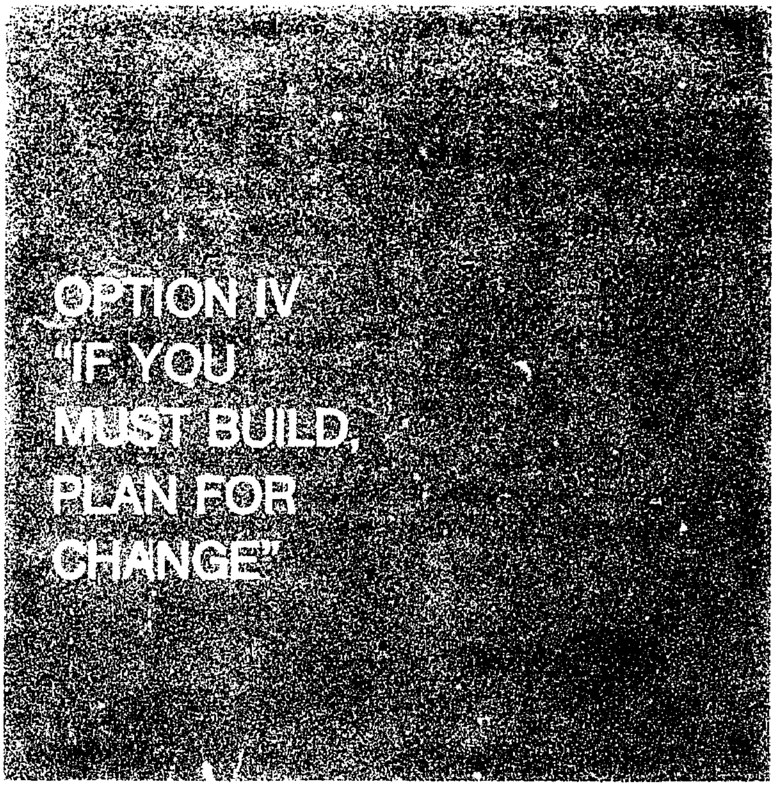
Document 1	Objectives and Options by William E. Blurock
Document 2	The Process of Planning by Stanton Leggett
Document 3	Facility Options by C. William Brubaker
Document 4	Planning for Change by Peter Tarapata
Document 5	Construction Options by Linn Smith

Special acknowledgment is due Robert Pangman, State of Michigan, Department of Education, for his assistance and guidance throughout this project; to William Weisgerber, State of Michigan, Department of Education, and to Casmer Heilman, College of Education, Michigan State University, for their assistance in critiquing and editing these documents; to the Michigan Middle Cities Education Association for their review and critique of the five documents; and to the Council of Educational Facility Planners, International for the printing and dissemination of the publications.

Project Co-Directors:

Floyd G. Parker, Director
Program and Staff Development
The Continuing Education Service
Michigan State University

Robert Paullin
Occupational Specialist
Division of Vocational Education
Department of Education
State of Michigan



Earlier discussion in this series dealt with the option of utilizing existing facilities in the community for career preparation. This section devotes itself to dealing with the question of what to do if such facilities are unavailable or inadequate and it becomes necessary to build new facilities.

1. *Programming for Change*

   A truism of modern school planning is that whatever is initially programmed to fit into a school facility is likely to be changed, not once, but many times over.

   Witness the changes that evolution in teaching methods, subject emphasis and technology have wrought in our schools since World War II.

   Circumstances outside the school—the a social patterns and life styles, the great g new knowledge, have accelerated change we teach and how we teach. Facilities ha be adjusted constantly to meet new educ challenges.

   The problem facing the facilities planner to understand how to control the demand change and how to rationally accommoda

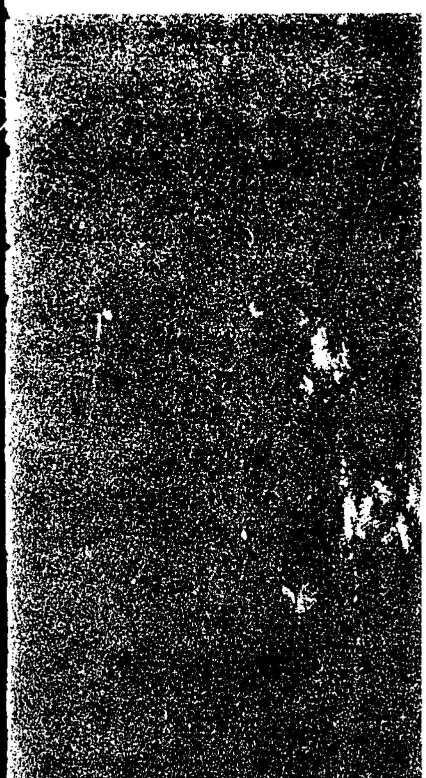
2. *The Concept of Space Management*

   If *change* has become such an ever-increa reality in the operation of a school facility why not *accept it as a constant* and orga ourselves to live with it.

Change, as it affects physical facilities, can controlled through a process known as *spac management*. It is the art and/or science of people, time and money to most effectively available space. In a school, it is the process matching students' learning needs (curricul the things of learning (space, tools, aids), p them within a time frame (schedule) and doi within an allotted budget.

More specifically, the process can be closel to the individual student's needs. As each s course of study is programmed, space would allotted and scheduled for him (in which to or with a group). His space-time slot would an accountable item, fitted into the space m master schedule. Should special or unique f be needed, they could be anticipated and se required. At a certain time, a specific space made available for a specific activity for a gi of time. As the task is done, the space woul recycled or reconstituted for another activity

The concept of space management is not a Plant managers in industry have for years re



series dealt with the option
ties in the community for
section devotes itself to
of what to do if such
or inadequate and it becomes
acilities.

nge

hool planning is that
ogrammed to fit into a
to be changed, not once,

hat evolution in teaching
hasis and technology have
s since World War II.

Circumstances outside the school—the altering of social patterns and life styles, the great growth of new knowledge, have accelerated change in what we teach and how we teach. Facilities have had to be adjusted constantly to meet new educational challenges.

The problem facing the facilities planner today is to understand how to control the demand for change and how to rationally accommodate it.

2. *The Concept of Space Management*

   If *change* has become such an ever-increasing reality in the operation of a school facility, then why not *accept it as a constant* and organize ourselves to live with it.

Change, as it affects physical facilities, can be controlled through a process known as *space management.* It is the art and/or science of managing people, time and money to most effectively use available space. In a school, it is the process of matching students' learning needs (curriculum) with the things of learning (space, tools, aids), placing them within a time frame (schedule) and doing this all within an allotted budget.

More specifically, the process can be closely attuned to the individual student's needs. As each student's course of study is programmed, space would be allotted and scheduled for him (in which to work alone or with a group). His space-time slot would become an accountable item, fitted into the space manager's master schedule. Should special or unique facilities be needed, they could be anticipated and set up as required. At a certain time, a specific space would be made available for a specific activity for a given length of time. As the task is done, the space would be recycled or reconstituted for another activity.

The concept of space management is not a new one. Plant managers in industry have for years rearranged facilities to accommodate new processes or to improve efficiency.

Management of space can be extended to all space within a school complex, both old and new. All space would be inventoried for its suitability as learning space. This could include on and off-campus space. With this information on hand, the space manager would then be in an excellent position to imaginatively and effectively utilize his space resources.

Space management as applied to schools is a new field and will require the development and training of personnel who will be cognizant of the techniques of space manipulation. They will need to know the space requirements of the various tasks to be accommodated, have a knowledge of the manipulable elements at their disposal and an appreciation of the costs involved in such changes.

Gaming and simulation through the use of physical scale models is an excellent method for studying and evaluating the effect of changes. Models are highly tangible tools which allow planners to project themselves into proposed space situations. With models, they can experiment and test new strategies for optimum use of facilities.

Developing new space to accommodate dynamic space management implies a structure which goes beyond what was once called flexible planning, as epitomized in the movable partition. What is implied is, indeed, a truly unencumbered "universal" space, one into which an almost infinite variety of settings can be placed. Implied also, is the need to devise a means for delivery of the services necessary to the operation of the facility without destroying the universal quality of the space. Exploring how this can be accomplished is the subject of the following chapter.

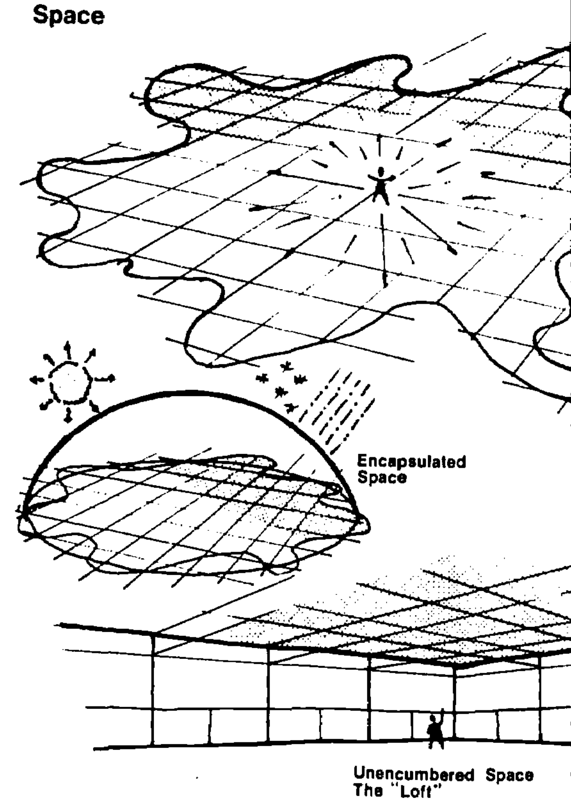
HOW TO DEVELOP SPACE TO BE MA

The easiest space to manipulate, of co
totally unencumbered space. This idea,
quickly becomes inhibited as soon as w
encapsulate the space to serve the nec
human habitation of providing *shelter,*
services.

This, we soon realize, is but a minor re
recognize that most of our needs for sp
horizontal plane and that vertically, we
relatively modest heights.

If we try to visualize a tractable "univers
within which we can freely set up and s
micro-environments, we quickly come

Space



odate new processes or to

e can be extended to all space
plex, both old and new. All space
for its suitability as learning
clude on and off-campus space.
n on hand, the space manager
excellent position to
fectively utilize his space

as applied to schools is a new
the development and training of
e cognizant of the techniques of
They will need to know the space
various tasks to be
a knowledge of the manipulable
posal and an appreciation of the
h changes.

ion through the use of physical
xcellent method for studying and
of changes. Models are highly
allow planners to project
osed space situations. With
eriment and test new strategies
acilities.

e to accommodate dynamic
mplies a structure which goes
ce called flexible planning, as
vable partition. What is implied
encumbered "universal" space,
most infinite variety of settings
ed also, is the need to devise a
the services necessary to the
lity without destroying the
he space. Exploring how this can
he subject of the following

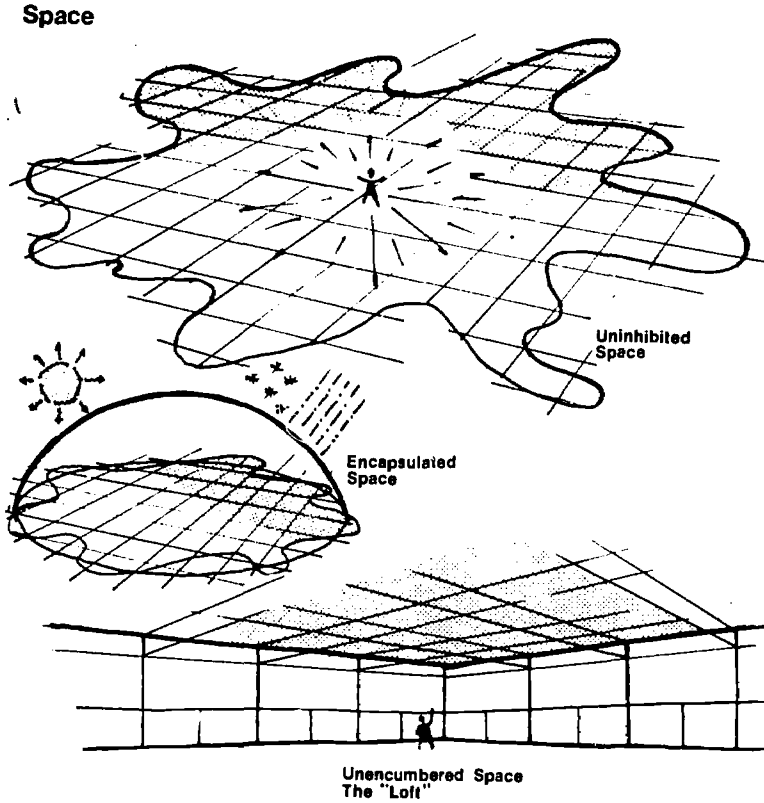
HOW TO DEVELOP SPACE TO BE MANAGED

The easiest space to manipulate, of course, is the totally unencumbered space. This idea, however, quickly becomes inhibited as soon as we try to encapsulate the space to serve the necessities of human habitation of providing *shelter, comfort and services*.

This, we soon realize, is but a minor restriction as we recognize that most of our needs for space are in the horizontal plane and that vertically, we can get by with relatively modest heights.

If we try to visualize a tractable "universal" space, one within which we can freely set up and stage our micro-environments, we quickly come upon one of the

Space

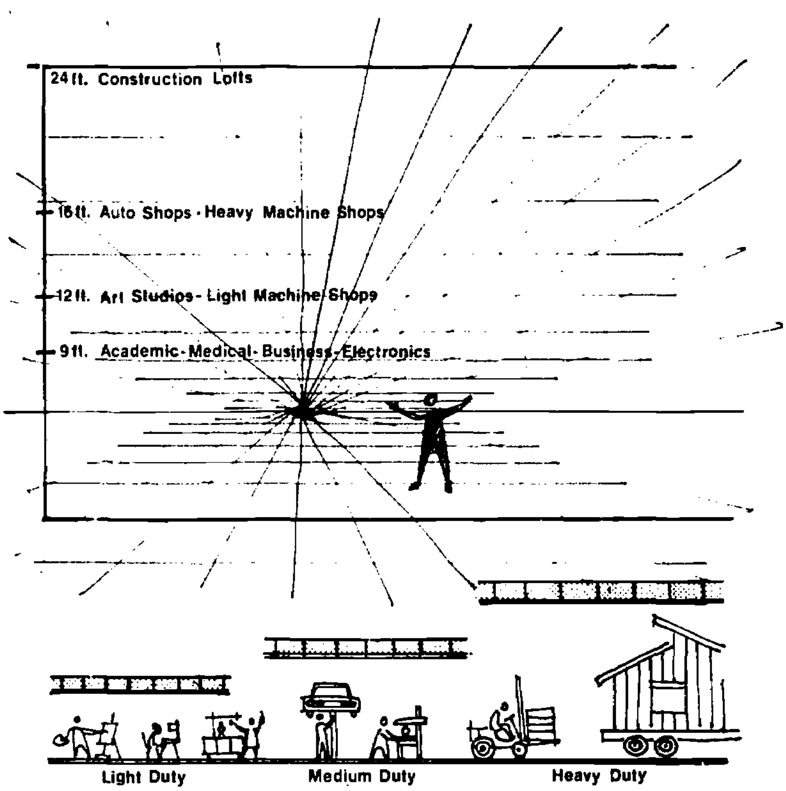


simplest forms of enclosed space, and that is the *loft.* Lofts can be as small as a single room or as large as an astrodome. For our purposes, we will think of them as omni-directional in the horizontal plane and limited vertically by functional and economic exigencies.

Horizontally, assuming we have a large enough site, the spread of space is limited only by the fire safety laws which specify the allowable travel distance from the deepest point within the interior to the nearest exit. Vertically, we can stack these lofts as many times as we wish until, again, we reach the limits allowed for fire safety.

Technically, enclosing such space is very simple if we work within a relatively short spanned, repeatable

Loft Heights



module. However, if we seek very large
spaces, we will need to resort to more
structural techniques such as space fra
structures, lamella arches or other soph
devices. A relatively recent newcomer o
enclosing scene is the air-supported st
economical and relatively simple plasti
anchored to the earth at its perimeter a
by air pressure. Another, similar enclos
plastic fabric tent hung from an externa
aluminum tubing. Both of these device
early stages of their evolution and hold
for the near future.

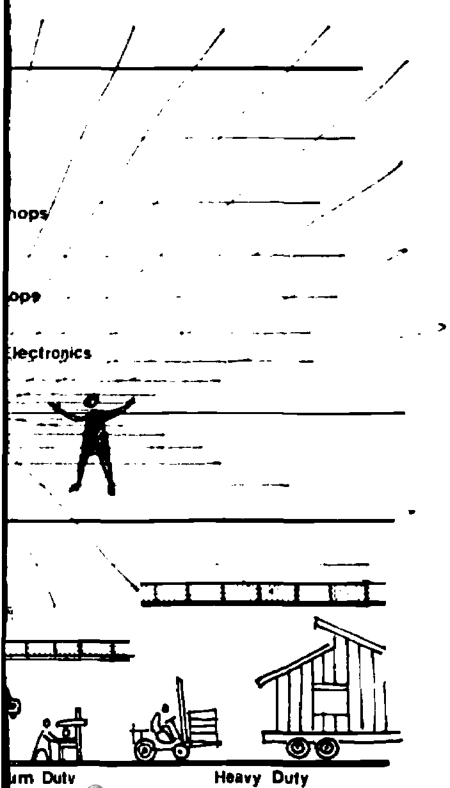
Once we have enclosed the space, we
to the creature comforts of those whom
sheltering. These must be supplied to t
without destroying the "universal" qual
space. Lighting, ventilation, heating an
be distributed horizontally to all points
These are necessities that come as a se
to be integrated with the structure. (Th
approach is the subject of a separate s
document.) If the lofts are stacked, vert
the horizontal distribution systems mu
introduced and this must be done in a
least disturbs the "universal space."

We should be aware in planning loft sp
natural ventilation is available only in t
immediately adjacent to the perimeter o
structure. Areas within the center must
mechanical ventilation. Even with this
core areas tend to become uncomfortab
during the summer months. The least t
done is to provide cooling at the core.
partial answer. Sealing of the core area
conditioned air negates the idea of a "
space. Therefore, a condition of the lof
that it be a fully air-conditioned space.

ed space, and that is the *loft.* a single room or as large as ırposes, we will think of them e horizontal plane and limited nd economic exigencies.

ve have a large enough site, nited only by the fire safety lowable travel distance from the interior to the nearest tack these lofts as many gain, we reach the limits

ıch space is very simple if we hort spanned, repeatable



module. However, if we seek very large, column-free spaces, we will need to resort to more complex structural techniques such as space frames, cable structures, lamella arches or other sophisticated devices. A relatively recent newcomer on the space enclosing scene is the air-supported structure. It is an economical and relatively simple plastic cover, anchored to the earth at its perimeter and supported by air pressure. Another, similar enclosure is the plastic fabric tent hung from an external frame of aluminum tubing. Both of these devices are in the early stages of their evolution and hold great promise for the near future.

Once we have enclosed the space, we need to attend to the creature comforts of those whom we are sheltering. These must be supplied to the structure without destroying the "universal" quality of the space. Lighting, ventilation, heating and cooling must be distributed horizontally to all points of the loft. These are necessities that come as a set of systems to be integrated with the structure. (The systems approach is the subject of a separate section of this document.) If the lofts are stacked, vertical linkage of the horizontal distribution systems must be introduced and this must be done in a manner which least disturbs the "universal space."

We should be aware in planning loft spaces that natural ventilation is available only in the areas immediately adjacent to the perimeter of the structure. Areas within the center must depend on mechanical ventilation. Even with this ventilation, the core areas tend to become uncomfortably warm during the summer months. The least that can be done is to provide cooling at the core. This is but a partial answer. Sealing of the core area to contain the conditioned air negates the idea of a "malleable" loft space. Therefore, a condition of the loft concept is that it be a fully air-conditioned space. The exceptions would be such areas as auto shops and construction shops which are large. open rooms with oversized doors which can be opened to allow cooling breezes to blow across the interiors.

Next. we must consider the service functions of energy distribution. communications and waste disposal. These. too. are systems to be integrated with the structure. However. unlike the "comfort service." their universal distribution is not necessarily a foregone conclusion. It would be ideal if one could afford such a total system. This would mean that one could tap the service system at any point. instantly. to accommodate any potential need. Reason tells us that we do not need full capability from the service system at all points at all times. The system would be overdesigned.

A more judicious approach is to concentrate the service functions at focal points within the structure and distribute branch lines to points of demand as needed. These service foci would have the capacity to handle anticipated peak loads for each service area.

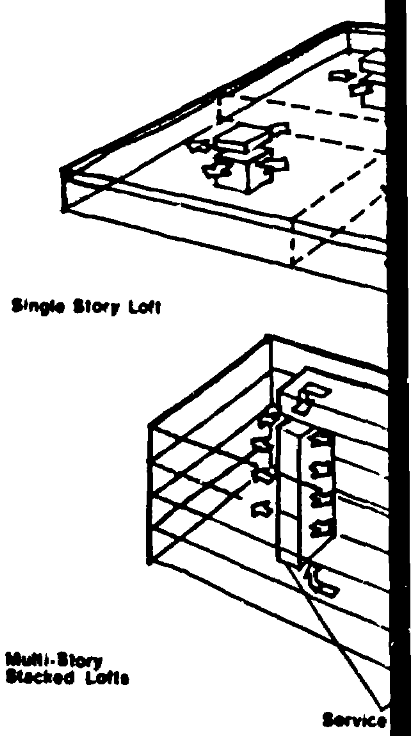
The size of each service area would be determined by how far the distribution branches can reach before becoming cumbersome to use and by the capacities of the branch lines.

Placement of these focal points becomes a planning function. They could be located at intervals along the periphery or at points within the interior of the structure.

Other hard elements of plan are stairs, toilets and elevators. These can be packaged together and located as free-standing elements outside the shell of the loft or treated as islands, placed at strategic points within the interior.

Note that the emphasis here has been to preserve the "universal" character of the interior space. All services are concentrated in the skin, i.e., the floor, ceiling or

Lofts With Internal Service (



wall or in free-standing island within the structure. All other

It is conceivable that all antic could take place within a sing efficient uses of this space w housing a collection of learni ceiling height requirements. portions of the program mix n then the sections with low cei excessive volumes. (One poss a sloping site—let the steppe height differential.) A more ef be to provide two or more sm heights. Space managers the

areas as auto shops and construction
re large, open rooms with oversized
an be opened to allow cooling breezes
the interiors.

consider the service functions of
ition, communications and waste
e, too, are systems to be integrated
ure. However, unlike the "comfort
universal distribution is not necessarily
clusion. It would be ideal if one could
otal system. This would mean that one
service system at any point, instantly, to
any potential need. Reason tells us that
d full capability from the service system
all times. The system would be

us approach is to concentrate the
ns at focal points within the structure
branch lines to points of demand as
service foci would have the capacity to
ated peak loads for each service area.

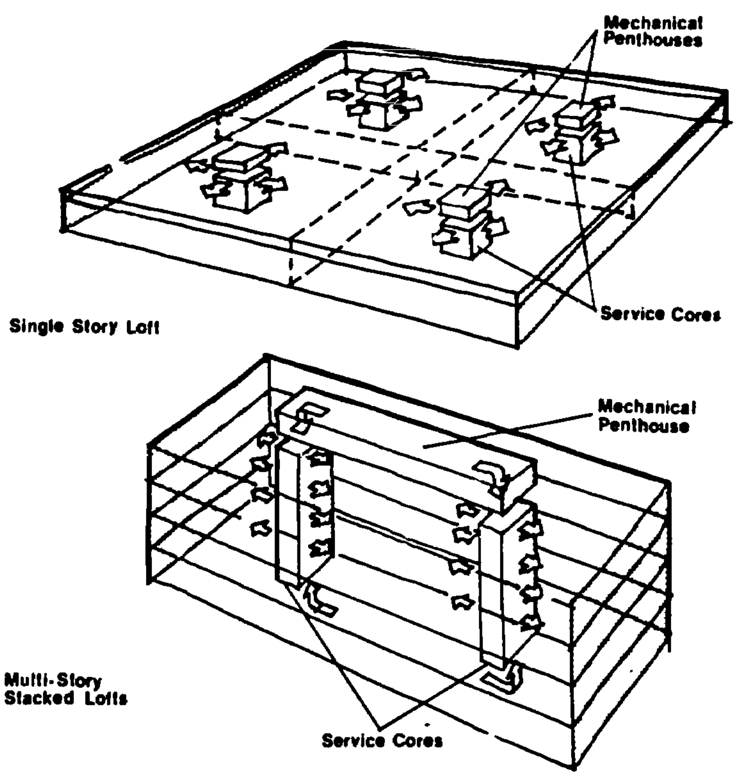
h service area would be determined by
tribution branches can reach before
bersome to use and by the capacities
ines.

hese focal points becomes a planning
could be located at intervals along the
points within the interior of the

nents of plan are stairs, toilets and
se can be packaged together and
-standing elements outside the shell of
ted as islands, placed at strategic
he interior.

mphasis here has been to preserve the
racter of the interior space. All services
ed in the skin, i.e., the floor, ceiling or

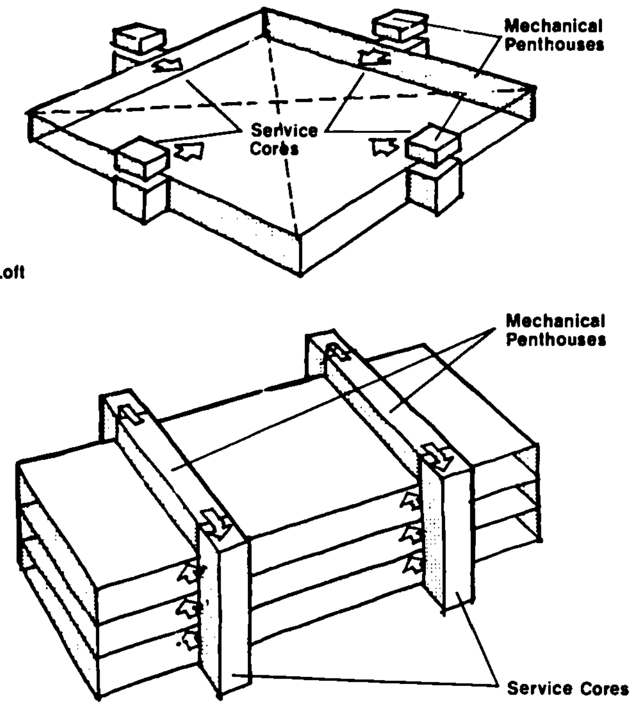
Lofts With Internal Service Cores



wall or in free-standing islands spaced outside or within the structure. All other space is unencumbered.

It is conceivable that all anticipated learning functions could take place within a single loft space. The efficient uses of this space would depend on it housing a collection of learning functions with similar ceiling height requirements. Otherwise, if some portions of the program mix need higher ceilings, then the sections with low ceiling needs end up with excessive volumes. (One possibility is a single loft on a sloping site—let the stepped floor provide the height differential.) A more efficient approach would be to provide two or more smaller lofts of different heights. Space managers then have an option of

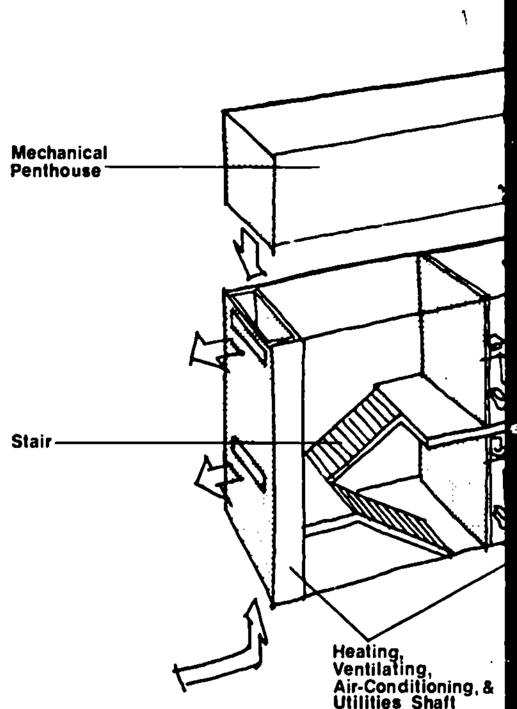
Lofts With External Service Cores



Single Story Loft

Multi-Story Stacked Lofts

Typical Two Story Service Core



tailoring functions and structure more effectively.

In addition to ceiling heights, there is the consideration of the light duty versus the heavy duty aspects of the facility. There is no need to provide the rugged construction and service one expects in an industrial setting in an office environment. Separate lofts would have separate characteristics.

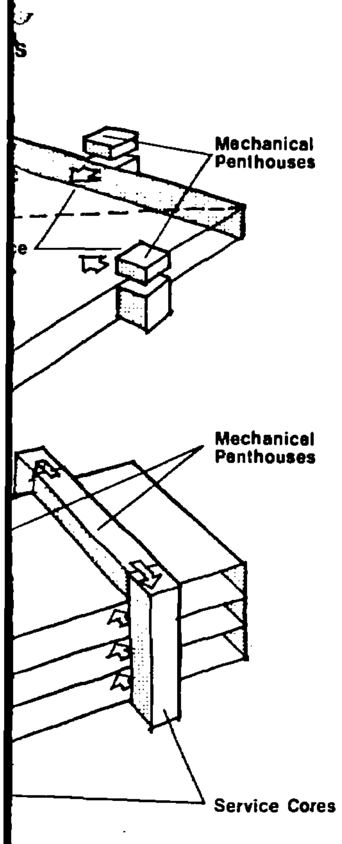
Clean and dirty as well as quiet and noisy functions need separation. These can be dealt with by compartmentation of a single loft. However, separate lofts may offer even better separation.

Direct or indirect access to spaces within the loft are other criteria to consider. Certain learning functions

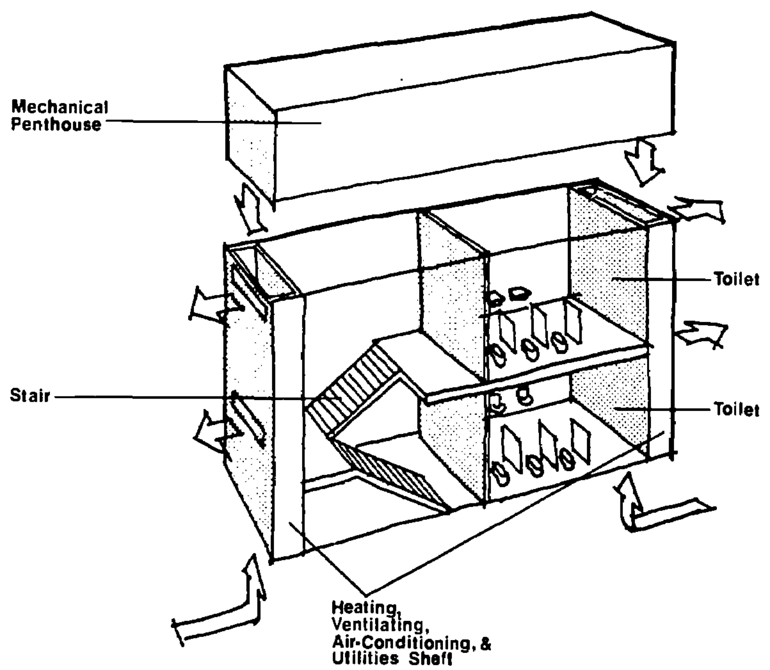
require direct and easy access to th
Large openings for material handlin
entrances and for the removal of bu
projects are frequent program requi
small lofts offer more perimeter tha
loft, thus presenting more options
openings.

Lofts can be paired or clustered in
combinations. Frequently, it is pos
spaces between for outdoor or indo
amenities which enhance and huma
environment.

s



Typical Two Story Service Core



re more effectively.

there is the
versus the heavy duty
s no need to provide the
e one expects in an
nvironment. Separate
acteristics.

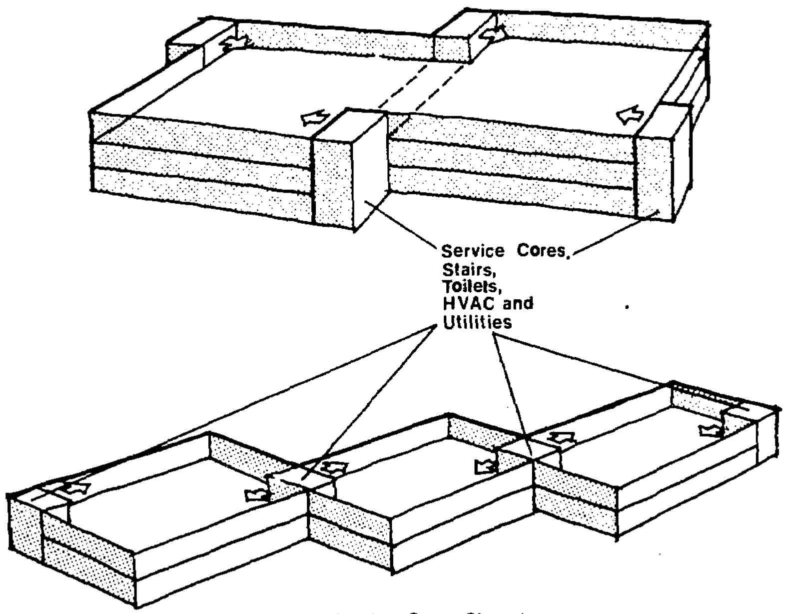
t and noisy functions
dealt with by
oft. However, separate
aration.

ces within the loft are
in learning functions

require direct and easy access to the out-of-doors. Large openings for material handling, vehicle entrances and for the removal of bulky, completed projects are frequent program requirements. Several small lofts offer more perimeter than a single large loft, thus presenting more options for access openings.

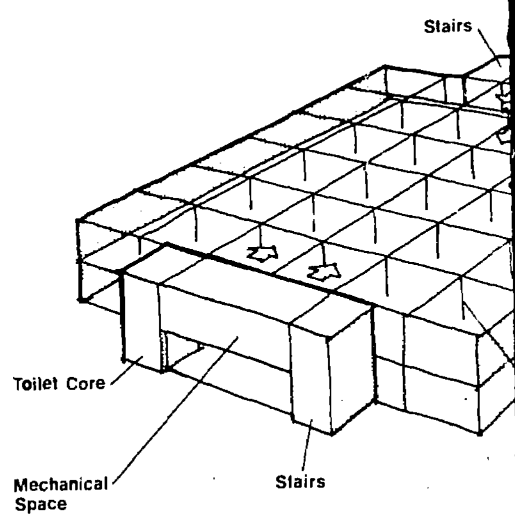
Lofts can be paired or clustered in many combinations. Frequently, it is possible to utilize the spaces between for outdoor or indoor courts and other amenities which enhance and humanize the environment.

Multi-Story Interlocking Lofts



Service Cores Shared By Adjoining Lofts

Two-Story Loft With External Service



HOW TO MANIPULATE AND CONTROL SPACE AND TIME

Given this "universal" space, how do we shape it to achieve our educational and human objectives?

Space Allocation—Territorial and Time Definitions

Allocating space by number to be accommodated
—individual
—companions—two persons
—social group—three or more
—community—tens or twenties
—society—hundreds

Allocating space by the "elbow room" needed to accomplish the learning tasks.

Allocation of space by character of t
noisy, clean—dirty, light duty—hea

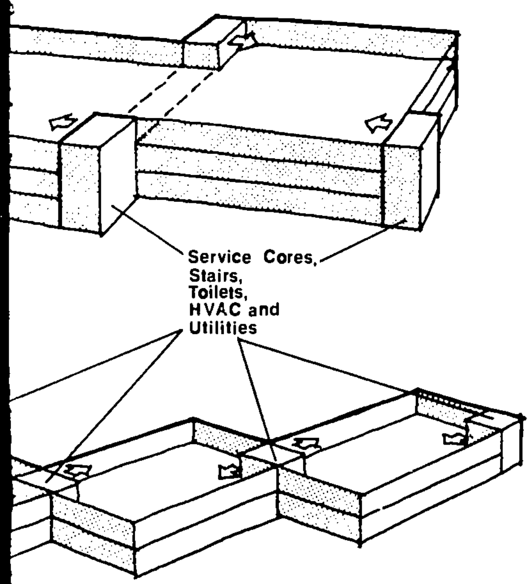
Allocation of space by services avail
the task.

Allocating the same space in differe
(conventional scheduling of space a
where a variety of classes use the sa
on a fractional time basis).

Allocation of a single space for a sir
(scheduling on the basis of students
or two courses and working continu
blocks of time until project is finish

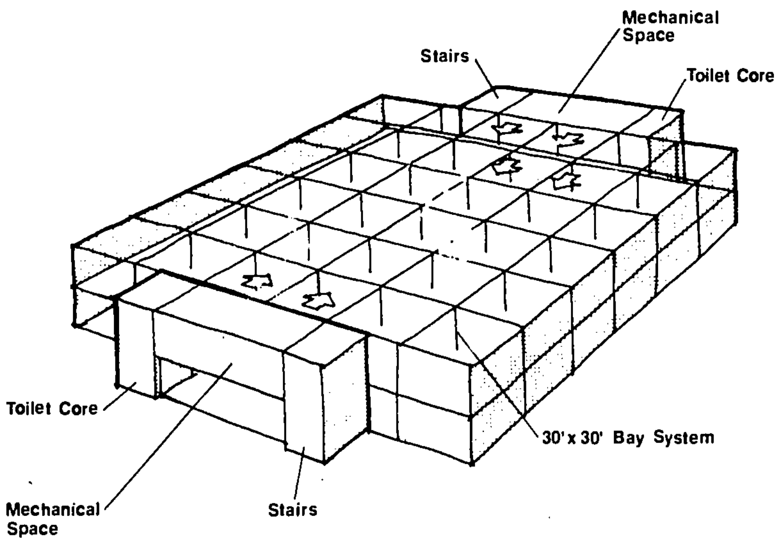
Multi-use space (with its good and b
connotations—set up and take dow

ing Lofts



Service Cores Shared
By Adjoining Lofts

Two-Story Loft With External Service Cores



Michigan Bell Telephone
Management Training Center

ATE AND CONTROL

al" space, how do we shape it to
onal and human objectives?

Territorial and Time Definitions

/ number to be accommodated

o persons
ree or more
s or twenties
ds

/ the "elbow room" needed to
rn ks.

Allocation of space by character of the task; quiet—noisy, clean—dirty, light duty—heavy duty.

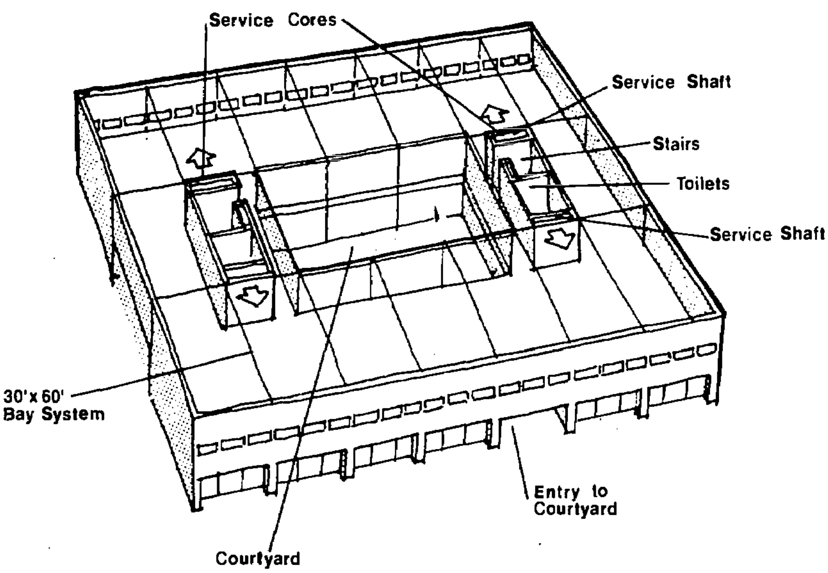
Allocation of space by services available to execute the task.

Allocating the same space in different time frames (conventional scheduling of space and equipment where a variety of classes use the same room set ups on a fractional time basis).

Allocation of a single space for a single project (scheduling on the basis of students taking only one or two courses and working continuously in large blocks of time until project is finished).

Multi-use space (with its good and bad connotations—set up and take down at beginning and

Two-Story Loft With Internal Service Cores



DeVries Institute of Technology
Phoenix, Arizona

end of class time).

Fixed, one-purpose type space (spaces so unique in character that only one use can be made of it) —greenhouses.

WHAT ARE THE MEANS OF SPACE MANIPULATION

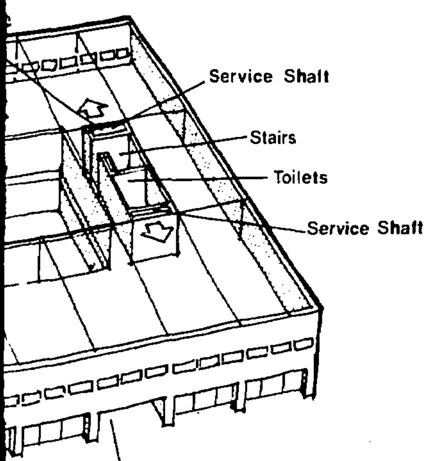
Within our universal space, we can now assume any number of spatial roles. We can create clusters of small rooms, large rooms or no rooms at all. The means for shaping spaces are a series of devices already available in the marketplace.

Compartmentation can be accomplished through the use of sound-deadening, demountable walls and sliding panels. Spaces can also be separated from one another with overhead, roll-up, slatte open mesh gates. In certain cases, w expected that an installation will rem an extended period of time, conventic materials such as light masonry bloc construction may be considered as te partitioning. Such materials, used in several alterations, can often be chea expensive, sophisticated system recy number of time. (There will be a temp created as these changes are made; process is quick and the mess will or temporary inconvenience.) Lightweig the necessary impact and abrasion re needed in shop environments.

The use of demountable partition sys that the loft structure be developed o basis to receive the wall panels. (The generally been accepted as being the option for incremental room sizing.)

Recently, there has been the develop of laying our work stations within lar offices called "office landscape." It is organizing a series of work alcoves in the device of low partition panels (5' These panels are self-supporting, hin vertical edges, and can be shaped int combinations of spaces. Elements of as desks, cabinetry and shelving are clip-on devices to the panels. These f combinations are laid out to follow th through the offices. The office landsc particularly effective approach to sha stations within a large, open space a be highly adaptable to the educationa Its most appropriate application seen carpeted, light duty, academic, busin etc., areas.

Service Cores



DeVries Institute of Technology
Phoenix, Arizona

ace (spaces so unique in
can be made of it)

F SPACE MANIPULATION

we can now assume any
can create clusters of
no rooms at all. The
re a series of devices
etplace.

ccomplished through the
mountable walls and
lso be separated from one

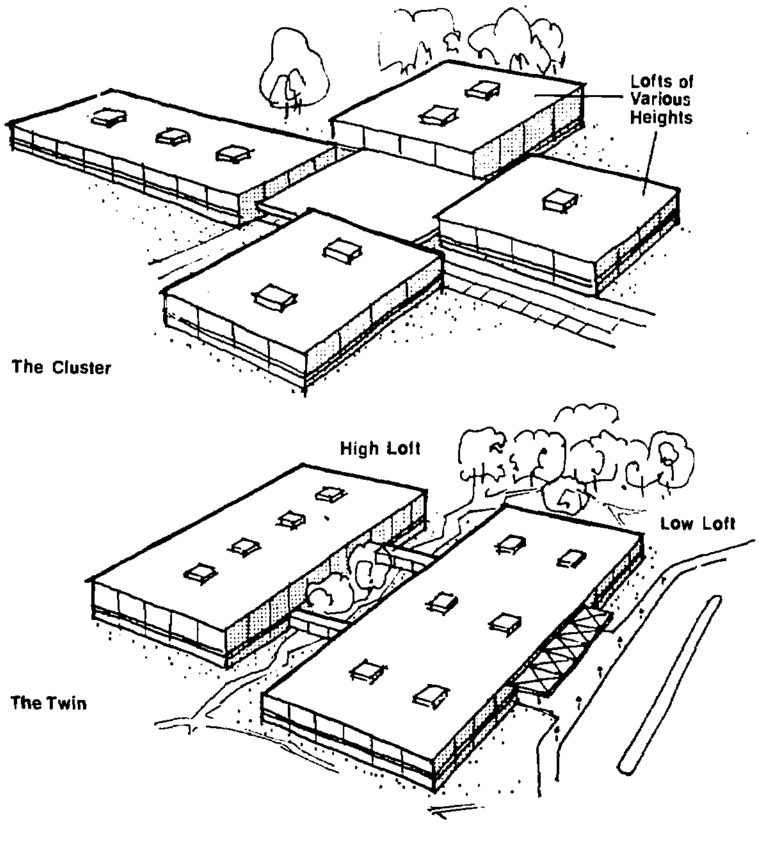
another with overhead, roll-up, slatted walls or roll-up open mesh gates. In certain cases, where it is expected that an installation will remain in place for an extended period of time, conventional, throw away materials such as light masonry block or drywall construction may be considered as temporary partitioning. Such materials, used in the course of several alterations, can often be cheaper than an expensive, sophisticated system recycled an equal number of time. (There will be a temporary mess created as these changes are made; however, the process is quick and the mess will only be a temporary inconvenience.) Lightweight masonry has the necessary impact and abrasion resistant qualities needed in shop environments.

The use of demountable partition systems implies that the loft structure be developed on a modular basis to receive the wall panels. (The 5' x 5' grid has generally been accepted as being the most suitable option for incremental room sizing.)

Recently, there has been the development of a method of laying our work stations within large commercial offices called "office landscape." It is a way of organizing a series of work alcoves into clusters by the device of low partition panels (5' to 7' in height). These panels are self-supporting, hinged at the vertical edges, and can be shaped into free-form combinations of spaces. Elements of furniture such as desks, cabinetry and shelving are attached by clip-on devices to the panels. These flexible combinations are laid out to follow the work flow through the offices. The office landscape concept is a particularly effective approach to shaping work stations within a large, open space and promises to be highly adaptable to the educational environment. Its most appropriate application seems to be in the carpeted, light duty, academic, business, medical, etc., areas.

Variations of the above-mentioned short, self-supporting panel systems can be developed for use in the medium duty areas to visually screen areas and supply wall surfaces for chalkboard, tackboard and shelving.

Combinations: One-Story Lofts



Floor surfaces in the loft space a
Carpeting can be laid over the co
appropriate. Note the comment, '
Care must be taken not to impose
where it might inhibit the inheren
of certain tasks. Learning can be
concern for the carpet.

Resilient tile, the old standby, st
areas where easily mopped surfac

Specialized flooring (computer ro
flexible means of handling spaces
underfloor cable spaces. It should
for it is an expensive system to in

Construction sheds may not need
all except in peripheral areas. Dirt
measure of flexibility in teaching
floor surface. It is highly appropri
masonry, mixing, pouring and tes
digging and laying trenches, back

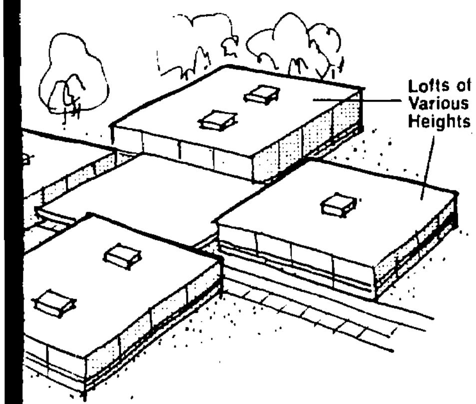
Ceilings may, in many cases, be a
exposed structure. Acoustical trea
acquired through the use of ceme
roof decking. Exposed ceiling stru
laboratories, galleries, classrooms
offer natural places for clamp-on l
special displays, accent light spac
"mood" lighting.

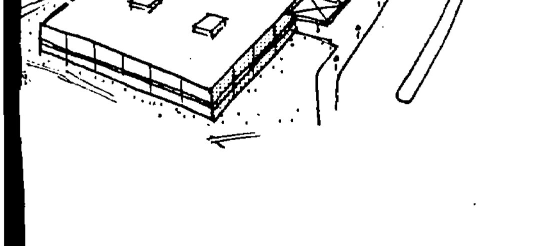
In many areas, of course, it will be
provide finished, acoustical ceilin
the character and quality of enviro

Lighting would be treated as a bas
supplying the need for good, overa
Supplemental lighting which can b
plug-in variety mentioned earlier,
introduced at any point in the loft
environment, much like stage ligh
potent device which is too little us

above-mentioned short, anel systems can be developed for n duty areas to visually screen areas urfaces for chalkboard, tackboard

e-Story Lofts





Floor surfaces in the loft space are basically concrete. Carpeting can be laid over the concrete, where appropriate. Note the comment, "where appropriate." Care must be taken not to impose carpeting into areas where it might inhibit the inherently messy execution of certain tasks. Learning can be constricted by concern for the carpet.

Resilient tile, the old standby, still is appropriate for areas where easily mopped surfaces are desired.

Specialized flooring (computer room flooring) is a very flexible means of handling spaces needing large underfloor cable spaces. It should be used judiciously for it is an expensive system to install.

Construction sheds may not need concrete floors at all except in peripheral areas. Dirt floors offer a measure of flexibility in teaching not found in another floor surface. It is highly appropriate for laying masonry, mixing, pouring and testing concrete, digging and laying trenches, backfilling, etc.

Ceilings may, in many cases, be allowed to show exposed structure. Acoustical treatment can be acquired through the use of cement bonded fibrous roof decking. Exposed ceiling structure in art laboratories, galleries, classrooms and elsewhere, offer natural places for clamp-on lighting to highlight special displays, accent light spaces and create "mood" lighting.

In many areas, of course, it will be appropriate to provide finished, acoustical ceilings, depending upon the character and quality of environment desired.

Lighting would be treated as a basic overall system, supplying the need for good, overall seeing capability. Supplemental lighting which can be of the clamp-on, plug-in variety mentioned earlier, can be readily introduced at any point in the loft to shape visual environment, much like stage lighting. It is a potent device which is too little used. It offers a means to break up the visually bland and tiresome effect of overall uniform lighting.

Communication would consist of a basic, overall announcing system, supplemented by a ceiling, plug-in, pole-mounted, relocatable power and communications source which can be placed almost anywhere in the room. This device is now on the market. It furnishes a telephone, a PA speaker, as well as power plugs.

THINGS MANAGEMENT

Career preparation emphasizes the "do" side of education as against the "read about it" side—it is a hands-on operation.

Educative artifacts, tools, exciters, are an integral part of career preparation and must be managed along with the spaces in which learning takes place.

It is the process whereby things are collected, the process started, set in motion, maintained, finally completed, dismantled and cleared away for the next event.

What does one do with the things currently not on line and being used? Where and how are these things to be stored? Traditionally, things are put away out of site until called forth for use again. This promotes the hazard of being "out of sight and out of mind." Things stored have a habit of waiting to be used until such time as they become "dodo's" and end up being abandoned. This is a static and expensive thing to have happen.

The solution is storage which advertises the potential of the things being stored, thus inviting their use. What is needed is a light, portable, service system which can be easily moved to dispensing points. Granted, a certain measure of "dumb" storage is necessary to act as a kind of attic. However, attics have a habit of being repositories of useless things.